



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/605,430	09/30/2003	JAMES N. HUMENIK	FIS920020187US1	2429
32074 7590 04/06/2007 INTERNATIONAL BUSINESS MACHINES CORPORATION DEPT. 18G BLDG. 300-482 2070 ROUTE 52 HOPEWELL JUNCTION, NY 12533			EXAMINER GORDON, BRIAN R	
			ART UNIT	PAPER NUMBER
			1743	
SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
3 MONTHS		04/06/2007	PAPER	

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

5

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/605,430		HUMENIK ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Brian R. Gordon		1743	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 January 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) 10-12 and 18-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 and 13-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I, claims 1-9 and 13-17 in the reply filed on January 16, 2007 is acknowledged. The traversal is on the ground(s) that there would be a serious burden on the examiner if restriction is not required (MPEP §808.02). This is not found persuasive because it is clear that each of the groups is directed to different inventions which acquire different classifications as previously explained in the prior Office Action.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 10-12 and 18-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on January 16, 2007.

### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-4 and 7-9 are rejected under 35 U.S.C. 102(e) as being anticipated by Natarajan et al. US 6,955,777

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention "by another," or by an appropriate showing under 37 CFR 1.131.

Natarajan et al. disclose a structure formed using 3 green sheets and 1 horizontal channel connecting two vertical wells for simplicity in illustration. The structure has been assembled from individual sheets by lamination. The assembly process is the same for ceramic structures with arrays of thousands of holes, with thousands of horizontal channels selectively connected to link vertical holes. The ceramic material may include alumina, glass ceramic, aluminum nitride, borosilicate glass and glass. The diameter of vertical wells can be 20 microns or more, the channel width can be 20 microns or more and the length can be a minimum of 20 microns. The shape of a well exposing a substance may be circular, rectangular, smooth or rough. The total thickness of the plate 10 may be any desired amount, but preferably is under 1 mm. The thickness of the greensheet depends on the application, but preferably ranges from about 3 mils to about 30 mils.

Additionally, the material in the passages may be one that forms a non-porous sheath on being sintered, so that the passages receives a liner such as that the sheath has alternate surface energy/activity than the matrix material/the body of the plate 10 (column 4, line 13+).

Natatarajan states the device is employed in mixing and testing materials in the pharmaceutical industry in which it is necessary to test the reaction (including biological activity) of chemical A to chemicals B<sub>1</sub> -B<sub>n</sub>, where n can be a large number, on the order of millions. (abstract).

As to claim 9, equivalent structures would inherently possess the same properties.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was

Art Unit: 1743

not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 5-6 and 13-17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Natarajan et al.

Natarajan et al. do not disclose a source of rinsing liquid.

It would have been obvious to one of ordinary skill in the art at the time of the invention to recognize the structure would be required to be washed/rinsed in between usages to avoid cross contamination.

As to claims 13-17, the reference states illustratively, horizontal channel 25 has a length greater than twice the diameter of an aperture 22 or 24. Illustratively, apertures 22 are about 20 microns or more in diameter. The diameter used in fabrication will depend on the particular application and technical variables such as the viscosity of the substance passing through, the surface tension/activity of the surface and fluid, desired flow force, capillary or forced flow, desired quantity and rate of flow, etc (column 2, lines 57+).

Furthermore, applicant admits in the specification that Autonomous Microfluidic Capillary System David Juncker, Heinz Schmid, Ute Drechsler, Heiko Wolf, Marc Wolf, Bruno Michel, Nico de Rooij, and Emmanuel Delamarche, Anal. Chem.; 2002; 74(24) pp 6139-6144; has described a specific design concept to regulate the flow of multiple reagents in a capillary-driven microstructure. In this concept, the flow of a reagent is initiated by its delivery to a service port and then terminates when the fluid has drained



to the point where the trailing meniscus has reached an element known as a capillary retention valve. Flow rates during this phase can be controlled by engineering the geometry and surface characteristics of the microstructure (see paragraph 0006).

As such it would have been obvious to one of ordinary art in the skill at the time of the invention that the concept of the CRV flow regulation maybe employed with that of the patent in the method as disclosed therein.

### ***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dugan; Trickett et al.; Berndt, Manfred et al.; Roitman, Daniel B. et al.; Dubrow, Robert S. et al.; Al-Obeidi; Fahad A. D. et al.; Singh; Sharat et al.; Gandhi; Khushroo et al.; Chien, Ring-Ling et al.; Harms; Michael R. et al.; O'Connor, Stephen D. et al.; Berndt; Manfred; Lehtinen; Kauko et al.; Sundberg; Steven A. et al.; O'Connor; Stephen D. et al.; Monti; Patricia C. et al.; Brown; James F.; Marinkovich; Vincent A.; disclose various layered devices.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian R. Gordon whose telephone number is 571-272-1258. The examiner can normally be reached on M-F, Telework Thurs., 1st Fri. Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1743

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Brian R Gordon  
Primary Examiner  
Art Unit 1743

brg

**BRIAN R. GORDON**  
**PRIMARY EXAMINER**